SECTION 15010 (to be used when my div 1 isn't)

BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 Related Documents

A. All sections of Division 1.

B. Examine all drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. Work shall be coordinated with other trades prior to installation to prevent interference and relocations.

1.2 Summary

A. This section includes general administrative and procedural requirements for mechanical installations. The following administrative and procedural requirements are included in this section to expand the requirements specified in Division 1:

1. Submittals.
2. Record documents.
3. Maintenance manuals.
4. Rough-ins.
5. Mechanical installations.
6. Cutting and patching.

1.3 Related Sections

A. The following sections contain requirements that relate to this section:

1. Division 15 Section "**ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT**," for factory-installed motors, controllers, accessories, and connections.

* 2. Division 15 Section "**BASIC MECHANICAL MATERIALS AND METHODS**," for materials and methods common to the remainder of Division 15, plus general related specifications including:

a. Access to mechanical installations.

b. Excavation for mechanical installations within the building boundaries, and from building to utilities connections.

1.4 Submittals *

A. General: Follow the procedures specified in Division 1, Section **"SUBMITTALS."**

B. Submit the number of mechanical related shop drawings, product data, and samples as listed below:

1. Shop Drawings: 8 copies of each item.

2. Product Data: 8 copies of each item.

3. Samples: None required.

C. Increase, by the quantity listed below, the number of mechanical related shop drawings, product data, and samples submitted, to allow for required distribution plus one copy of each submittal required which will be retained by the Mechanical Consulting Engineer.

1. Shop Drawings - Initial Submittal: 1 additional blue-or black-line prints.

2. Shop Drawings - Final Submittal: 1 additional blue-or black-line prints.

3. Product Data: 1 additional copy of each item.

D. Additional copies may be required by individual sections of these specifications.

1.5 Record Documents

* A. Prepare record documents in accordance with the requirements in Division 1 Section **"PROJECT RECORD DOCUMENTS."** In addition to the requirements specified in Division 1, indicate the following installed conditions:

1. Ductwork mains and branches, size and location, for both exterior and interior; locations of dampers and other control devices; filters, boxes, and terminal units requiring periodic maintenance or repair.

2. Mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion compensators, tanks, etc.). Valve location diagrams, complete with valve tag chart. Refer to Division 15 Section "Mechanical Identification." Indicate actual inverts and horizontal locations of underground piping.

3. Equipment locations (exposed and concealed), dimensioned from prominent building lines.

4. Approved substitutions, Contract Modifications, and actual equipment and materials installed.

5. Contract Modifications, actual equipment and materials installed.

B. Preparation of Transparencies: Immediately prior to inspection for Certification of Substantial

Completion, review completed marked-up record Drawings with the Architect. When authorized, prepare a full set of corrected transparencies of Contract Drawings.

1. Incorporate changes and additional information previously marked on print sets. Erase, redraw, and add details and notations where applicable. Identify and date each Drawing; include the printed designation "PROJECT RECORD DRAWINGS" in a prominent location on each Drawing.

2. Refer instances of uncertainty to the Engineer for resolution.

3. One set of transparencies of original Contract Drawings will be furnished to the Contractor by the Owner for use in recording changes and additional information. The Contractor shall request these transparencies by letter to the Engineer. Other printing as required is the Contractor's responsibility.

C. Review of Transparencies: Before copying and distributing, submit corrected transparencies and the original marked-up prints to the engineer for review. When acceptable, the Engineer will initial and date each transparency, indicating acceptance of general scope of changes and additional information recorded, and of the quality of drafting.

1. Transparencies and the original marked-up prints will be returned to Contractor for organizing into sets, printing, binding, and final submittal.

2. Note related Change Order numbers where applicable.

3. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

4. The final submission shall include:

a. The original marked-up prints maintained during construction.

b. Mylar transparencies (one set) identified as "PROJECT RECORD DRAWINGS."

c. Two sets of "PROJECT RECORD DRAWINGS" printed from the mylar transparencies.

* D. Engage the services of a Land Surveyor registered in Vermont as specified in Division 1 Section **"FIELD ENGINEERING"** to record the locations and invert elevations of underground installations.

1.6 Maintenance Manuals

* A. Prepare maintenance manuals in accordance with Division 1 Section **"PROJECT CLOSEOUT."** In addition to the requirements specified in Division 1, include the following information for equipment items:

1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.

2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.

3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.

4. Servicing instructions and lubrication charts and schedules.

B. Upon completion of the work, and as a condition of it's acceptance, deliver to the Project Engineer *Consultant three (3) copies of a manual describing the system. Prepare manuals in durable plastic binders approximately 8½" x 11" in size with at least the following:

1. Identification on, or readable through, the front cover stating the general nature of the manual.

2. A listing of Names, addresses, and phone numbers of the Contractor and all subcontractors.

3. Neatly typewritten index near the front of the manual, furnishing immediate information as to the location in the manual of all data regarding the installation.

4. A copy of all reviewed submittals and shop drawings.

5. A simplified description of the operation of all systems including the function of each piece of equipment within each system. These descriptions shall be supported with a schematic flow diagram.

6. Description of function, normal operating characteristics and limitations, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.

7. An explanation of the control sequence of each system along with the following instructions wherever applicable:

   a. Emergency procedures for fire or failure of major equipment.
   b. Normal starting, operation and shutdown.
   c. Summer/Winter shutdown or switchover.

8. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions.

9. Maintenance procedures for routine preventative maintenance and troubleshooting;

disassembly, repair, and reassembly; aligning and adjusting instructions.

10. An outline of a preventive maintenance program for each item which shall include a schedule of inspection and maintenance. It shall suggest the maintenance and inspection that should be done with outside service.

11. Servicing instructions and lubrication charts and schedules.

12. Complete name and address of nearest vendor of replaceable parts.

13. Copy of all guarantees and warranties issued.

14. Where contents of the manual include manufacturer's catalog pages, clearly indicate the precise items included in this installation and delete , or otherwise clearly indicate, all manufacturer's data with which this installation is not concerned.

1.7 Delivery, Storage and Handling

A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

B. Contractor and his subcontractors shall be responsible for the transportation and handling of all materials from, to, and at the project site. All damages thereto shall be replaced by the responsible party at no additional cost to the Owner.

C. Properly identify all materials shipped to the Contractor at the project site with the Contractors name, project title, and specific delivery point. Receipt of materials is the Contractors responsibility.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 Rough-In

A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

B. Refer to equipment specifications in Divisions 15 and 16 for rough-in requirements.

3.2 Mechanical Installations

A. General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:

1. Coordinate mechanical systems, equipment, and materials installation with other

building components.

2. Verify all dimensions by field measurements.

3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.

4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed or as they exist.

5. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the work. Give particular attention to large equipment requiring positioning prior to closing in the building.

6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.

7. Coordinate connection of mechanical systems with exterior underground utilities and services. Provide required connection for each service.

8. Install systems, materials, and equipment to conform with approved submittal data to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Engineer.

9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.

10. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.

11. Install access panel or doors where units are concealed behind finished surfaces. Access panels and doors are specified in Division 15 Section "BASIC MECHANICAL MATERIALS AND METHODS".

3.3 Access Panels

A. This Subcontractor shall furnish all access panels necessary to his work in concealed spaces and of the correct size needed to maintain his work. These access panels shall be compatible to the type of construction where they will be installed.

B. Access panels shall be similar to those manufactured by Inland Steel Products Company, L.M. Walsh Company Babcock-Davis Associates, Inc., or equal.

1. Install systems, material, and equipment giving right-of- way priority to systems required to be installed at a specified slope.

3.4 Cutting and Patching

* A. General: Perform cutting and patching in accordance with Division 1 Section **"CUTTING AND PATCHING."** In addition to the requirements specified in Division 1, the following requirements apply:

1. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

B. Perform cutting, fitting, and patching of mechanical equipment and materials required to:
1. Uncover work to provide for installation of ill-timed work.
2. Remove and replace defective work.
3. Remove and replace work not conforming to requirements of the Contract Documents.
4. Remove samples of installed work as specified for testing.
5. Install equipment and materials in existing structures.
6. Upon written instructions from the Engineer, uncover and restore work to provide for Engineer's observation of concealed work.

C. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

D. Cut, remove, and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, heating units, and other mechanical items made obsolete by the new work.

E. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

F. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

1. Patch existing finished surfaces and building components using new materials matching existing materials and experienced installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

2. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

END OF SECTION 15010